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COMMUNICATIONS, ORIGINAL AND SELECTED.

NATURAL HISTORY OF THE HERRING.

TRANSLATED FROM L'HISTOIRE NATURELLE
DES POISSONS PARRENT—BY BLOCH.

THE Herring of the North, or the Stromling of the Baltic, is distinguished from other fish of the same genus, by the projection of the lower jaw, which is bent backwards, and by the seventeen rays of the anal fin. There are eight rays in the gill membranes, eighteen in the dorsal, pectoral and caudal fins, and nine in the ventral.

The head is small, the eye large, the iris silver, and the eye-ball black. The aperture of the mouth is small, the tongue short, pointed, and furnished on the inside with small teeth. The openings of the gills are usually of a violet, or red colour, which vanishes soon after death. The back is thick, round and blackish; the lateral line, which is near, is scarcely visible, the sides of a silver colour. Except during spawning time the belly is sharp and indented. All the fins are grey and small, except that of the tail, which is pointed and large.

This fish, so generally known, and equally admitted to the pompous table of the rich and the cottage of the poor, has been long known to our ancestors. They, however, did not derive from it all the profit which we have procured during the last centuries. It did not form a considerable branch of commerce with them as with us, because they did not know how to preserve it from putrefaction, as we do, by means of sea-salt. Towards the end of the thirteenth century, chance revealed to William Beukelen, a native of Brabant,* this secret, which

has saved so many lives, as it had discovered to Schwartz that of gun-powder, by which such numbers have perished. Beukelen's intention was undoubtedly to preserve the fish for some time, which led him to the discovery of packing it in casks with sea-salt. By care and reflection his method has been gradually improved, and at length brought to the perfection which it has now attained. This benefactor of mankind was fully deserving of the mark of attention paid to his memory by the Emperor Charles V. who celebrated this invention one hundred and fifty years after his death, by eating a herring on his tomb. This invention is so much the more important as the fish is of a soft and fat nature, is caught principally during the hottest part of the summer, and spoils very soon unless this precaution be taken.*

This fish is found in the Northern Ocean, in the North Sea and the Baltic, which communicates with it, as well as in the Atlantic, where it inhabits the depths, whence it departs, partly in spring, partly in summer and autumn, to take shelter in the rugged and craggy places in the mouths of rivers, where it may spawn and procure sustenance.

It is a very general opinion, that during winter the herrings retire into the Frozen Ocean, and that they thence undertake long voyages to the Southern parts of Europe and America. Let us see what Dott, Anderson, Duhamel and Bomare say concerning this.—The

* Yarmouth has long been famous for its Herring-fair (this fair was regulated by an act, commonly called the Statute of Herrings; in the 31st of Edward the third) that town is obliged by its charter, to send to the Sheriff of Norwich, one hundred herrings, to be made into twenty-four pies, by them to be delivered to the Lord of the manor of East Carleton, who is to convey them to the king. PERRANT.

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* Others say that this secret was discovered by a Scotch fisherman, who having quitted his country in disgust, taught the Flemings the art of barrelling herrings. The herrings of Flanders long maintained a high character.

herrings, terrified by the number of enemies which pursue them, retire into the Frozen Ocean, where their enemies cannot live under the ice, for want of air. But as they multiply exceedingly in this sea, they are compelled, from want of food, to send out colonies in the beginning of every year.* These colonies going from beneath the ice, extend over a space of some hundreds of miles; but, as during their journey they are attacked by a great number of enemies, they are dispersed and divided into two wings, the right turns towards the west, the left to the east. The first press upon one another, and seek a shelter on the coast of Iceland, where they arrive in the month of March, then they take a westerly direction, and come to the banks of Newfoundland.

* The great rendezvous of the herring is within the Arctic circle, there they continue for many months, in order to recruit themselves after the fatigue of spawning, the seas within that space, swarming with insect-food, in a degree far greater than in our warmer latitudes. PENNANT.

Mr. John Gilpin, in the *Transactions of the American Philosophical Society*, Vol. ii. p. 236, says, "the herrings are a fish of passage and observe one regular annual route in the sea, shifting their climate with the sun, and that it is the same scoole which is found at different times about Britain and America. For they are found on the other side of the Atlantic, or rather in the North Sea, in the favourable month of June, about the islands of Shetland from whence they proceed down to the Orkneys, surround the British Isles, and uniting again off the Lands-end, in September, steer south-west across the Atlantic, and appear next on the American coasts. They arrive in Georgia and Carolina the latter end of January, in Virginia in February, and coasting from thence eastward to New England, they divide and go into all the bays, rivers, creeks, and even small streams of water, and continue spawning in fresh water until the latter end of April, when the old fish return into the sea, where they change their latitudes by a Northward direction, and arrive at Newfoundland in May, after which we neither hear or see any thing more of them in America, until their return in the ensuing spring. This course of migration, Mr. Gilpin has traced on a chart of the Atlantic.

Their future course is not accurately known. The others on the contrary, direct their course towards the South, and divide into two columns, one of which proceeds along the coast of Norway, and enters the Baltic Sea by the Sound and the Belts, while the other turns to the west, towards the Shetland and Orkney isles. There this latter column again divides; one part turns towards Ireland and Scotland, then turning round Ireland, enters the Spanish Sea (the Bay of Biscay) and passes through the British Channel to gain the coast of the Netherlands. The other division follows the eastern coast of Scotland and England, and passes into the North Sea, where the two columns re-unite. These great bodies of herrings send out smaller detachments on all sides, towards the coasts of France, Brabant, Flanders, Holland, Friesland, Zealand, Holstein, Bremen, Lubeck, Pomerania, Sweden, Denmark, and Livonia. Finally, after having presented themselves to the inhabitants of all these countries, they re-unite in the North Sea, and disappear; at least no traces of them can be afterwards discovered on the coast of Europe, and it is thought that they return to their former station.*

This recital though ingenious and bordering on the marvellous, and though generally admitted, does not prevent me from expressing some doubts as to its veracity, which I leave to the decision of the learned.

* Whether the course of the herrings depends on the set of the current, has not been sufficiently observed to enable us to account for their appearance on certain parts of a coast and not on others. It is said that Lough Swilly is the first part of the western coast of Ireland where the herring appears, and Tor Point on the eastern; so that the whole space from Lough Swilly to Tor Point is commonly without herrings. Now on examining a chart of the northern coast of Ireland, the course of the northern stream seems in part to countenance the opinion that the currents have a great influence in directing the herrings to particular coasts; and that when storms obstruct the natural course of the current, the herring may appear at one time where they are never found again. As this is a very interesting subject, we will be obliged to any person who can give us any information on it.

1. It is not true that one wing emigrates annually to Iceland; for Horrebow, who lived several years in that Island, assures us that several years often pass, during which not a trace of them can be discovered.—According to Olaffen, Egede, and Otto Fabricius, this fish is seldom found on the coasts of this island; which is in itself very probable, for if the herrings visited it, the Danish government, ever anxious to profit by its fisheries, would not have failed to have taken advantage of this.

2. It is not possible that in so short a space of time, that is to say, from spring to autumn, they could perform a voyage of so many thousand miles; for it is certain, that in smooth water, a fish can scarcely proceed more than a quarter, or at most half a mile, in twenty-four hours.—The herring must necessarily move much more slowly when it has to struggle against the agitation of the sea.

3. Herrings are to be met with on the coasts of Europe during the whole year. In Swedish Pomerania, for example, they begin to catch them in great numbers from January till March, and in many parts of the Baltic, from March till November; as also during this latter season in Norway. They also catch them in great numbers in the seas round Gothland, from October till December; the French take them to the end of the year. They find them also the whole year round on the coast of England, and the Scarborough fishermen never draw their nets without finding some herring among the other fish. When the Dutch fishermen are not satisfied with their success, they continue it till February on the coasts of Scotland. In the north of Holland, that is, towards Enkhuisen, Monckendam, and Hoorne, they fish for herring in February, March, and April. In fine, they fish for them in Sweden till the middle of winter.

4. If this fish comes in large bodies from the North pole, why does the smaller kind turn towards the Baltic, and the larger towards the North Sea?

5. If the herrings are pursued by the whales, why do they travel many hundred miles farther than is necessary for avoiding the danger? Does the sight of this creature, or, as M. Stroh asserts, its dreadful bellowings inspire them with such terror as to continue long time after they have escaped the danger? In such a case I do not see why they should expose themselves a second time, in winter to the attacks of this dreadful enemy.

6. If the herrings came from the North would they be caught during the whole Summer in such numbers on the coast of Norway? Would they not, like birds of passage, be found in great numbers at some seasons, and seldom, or not at all, at others?

7. Should we not then observe some marks of their return? Even though they do not approach the coasts, would not the grampus, the porpoise, and the whale, which pursue them incessantly, discover their course?

8. Were it only want of food which compelled the herring to send out colonies, why would this always occur at the same time, and in the same season? Is it probable that their provisions should fail exactly at the end of the year?

9. If the whales drive them in shoals into the bays, why are they found in shoals in places, such as the North Sea, and the Baltic, where there are none of these formidable enemies?

All these difficulties will vanish, if we study nature attentively in all her operations. The herrings in common with all other fish quit their usual abode during spawning time, and seek out places where they can deposite their spawn undisturbed.—For this reason they leave the deep water, like the others, in order to find solitary places, rough and broken by the violence of the currents.—Wherefore, about this time, when the fishery is most abundant, the milt is liquid in the male, and the eggs separate in the female. The spawning season draws near, and it is this instinct, not the dread of whales, that draws them into such places. Like all other fishes they spawn at three

different seasons, generally according to their age: besides, as the spawning time of the same fish occurs sometimes sooner, sometimes later according to the temperature of the water, and of the air, it is easy to discover why the herring appears at different times. For example, in the Baltic and on the coast of Norway a small kind which comes to spawn there, is seen, in summer; a shoal of larger size appears, in autumn; a smaller kind again appears, full of eggs and milts, and which therefore is on the point of spawning. The same takes place on the coast of Scotland. For this reason the Dutch fishermen divide this commodity into three qualities, which they call *virgin herrings*, *empty herrings*, and *full herrings*. Empty herrings, are those in which neither milt nor eggs are found; virgin herrings, those in which the milt and eggs are liquid; and full herrings, those whose bodies are full of milts and eggs. Empty herrings are nothing more than such as have spawned in spring, and full herrings such as spawn in autumn and winter, while the virgin herrings spawn in summer. It is well known that sea fish, or those in lakes, who go up the rivers or streams in spring, do not return till autumn to the place of their usual habitation. This is undoubtedly the case with herrings also, and hence proceeds their dispersion into a variety of places in winter. It is also not improbable that the herring, which is a small sea-fish, spawns like many species of small river fish, more than once in the year. Nature has different means of attaining the same end, for as the small frequently become the prey of the large, the former must necessarily multiply much more than the latter, this is effected by their spawning more frequently. The same may be remarked in small birds and other species of animals. This prodigious multiplication has led many writers to believe that this fish spawns also beneath the ice in the polar regions. When we reflect on the immense extent of space which has been given to the herring for its habitation, we ought not to be astonished at their prodigious numbers, and astonishing multi-

plication, observed even so early as the time of Aristotle, which serves to repair the immense numbers daily destroyed: all this happens under our own eyes in the case of river fishes, in a manner proportionate to the small space they occupy. If fish was not so much disturbed during the spawning time, they would multiply in a manner still more extraordinary. This is demonstrated by experiments lately made by an intelligent writer on natural economy. He made a carp-pond, containing about seven acres, which he supplied with plenty of provisions, and put into it three females, and four males. They produced young to the number of 110,000, which was too considerable, and prevented them from attaining their full growth. We may also draw another proof of the prodigious multiplication of fish, from the greater number of males than females. This circumstance is very favourable to the increase of fish. The places in which they spawn also contribute much to this; as these are generally in deep water, and at a distance from the shore, they are much less exposed to the danger of being disturbed or dispersed by tempests and inundations. I will add one circumstance more.

The wise laws enacted in the United Provinces to preserve the character of their herrings, contribute in no small degree to facilitate their increase.—Every sailor and fisherman, before he sets out, is obliged to bind himself by oath, not to cast his nets before the 25th of June, and on his return, he must again declare on his oath that he has faithfully adhered to this engagement. It is true that the chief end of these precautions, is to procure the best sort of herrings; they have not only succeeded in this, but also thus encourage the multiplying of these creatures, by preventing their being interrupted in spring from fulfilling the great law of nature. Another law forbids the fishing to continue longer than the 25th of January. This is no less favourable to their increase, as those who spawn later are thereby suffered to remain undisturbed. These regulations have had such effect, that for several centuries the herring fishery

is carried on more successfully by the Dutch than by other nations, because fishes like to return to places where they have spawned without disturbance, and to those in which they were born. Formerly this fishery was much more considerable in Norway than at present. It has also failed considerably in Sweden: in Prussia also, where it was once very considerable, it is now almost totally extinct.

The disturbance of the fish, however, is not the only cause which prevents them from appearing a second time on a coast; a number sufficient to preserve the species always escapes through the nets, provided the fishermen, through a desire of increasing their prize, do not make the meshes too small, and that they do not take the fry along with the full grown, as is done by the Swedes. This method is extremely prejudicial: and it is perhaps from the same reason that the fisheries have failed in Prussia. The law in Holland, which regulates the size of the meshes in herring nets, is very useful. For thus, they not only always get large herrings, but they secure a plenty in future, because those of a smaller size escape through the nets, and propagate the species. Finally, it is well known by experience, that the water, the nature of the bottom, and other circumstances, contribute largely to render fishes larger, fatter, and better tasted in one country than in another. The salmon and salmon-trout taken in the Baltic are much inferior to those of the North Sea. It seems to me that the same reason will account for the herrings in the Baltic being much smaller and worse tasted than those of the North Sea.

The herring, so often exposed to the voracity of other creatures, belongs to the class of voracious fishes. It lives particularly on small crabs; Neucrantz has found in its stomach many half digested; *Loewenhock* has found fishes' eggs in the oesophagus. It is also fond of worms. The Norwegian fishermen have often found its bowels filled with a kind of red worm, which they call *roe-aat*. When the fish is full of such food, it is generally supposed that it is diseased; but the truth is, that these worms being very liable to corrupt, spoil the herring before it is salted.

As soon as these creatures are observed in herrings newly caught, the fishermen leave them some time longer in the water in order that they may be completely digested, and rendered capable of preservation till they are cured.

We have seen that the herring spawns at different times; with respect to this the following remarks have been made: Some days before they make their appearance in shoals, a few scattered males are met with, and moreover, a greater number of females than males are observed in the same shoal. When the fish is about to spawn, it rubs its belly against the rocks, throws itself now on one side, again, on the other, draws in the water eagerly with its mouth open, rejects it immediately, and agitates its fins with violence. As they generally come in large shoals, the sea is muddied by the great quantity of liquid spawn thrown out. At this time an offensive smell comes from them, which is perceptible to a great distance; in rubbing themselves, they lose part of their scales, which are seen floating on the water. These signs point out to the fishermen the places where they ought to throw their nets.

The *stromling*, or spring herring of the Baltic, spawns when the ice begins to melt, and this continues till the end of June. Then comes the largest kind, or the summer herring: and lastly the autumn herring, which spawns from St. Bartholemew to the middle of the month of September. All these kinds do not spawn at once, but by degrees. They then appear in shoals, and after having employed two or three days in spawning, they return to the open sea, making a noise very similar to a shower of rain. The summer herring keeps at a greater distance from the shore, and spawns in the deeper places; it is known by the eggs with which the nets and lines are often covered, as with a bark.

As to further particulars, it is not necessary to mention here, in detail, that at these times the herrings form shoals which observe a certain order; as this also happens to other fish, as the roach, the salmon, and the Baltic trout (*salmo lavarettus*). The same may be remarked in birds of passage, and field mice.

To be Continued.